DOCUMENT RESUME

ED 154 324 CG 012 600

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TITLE Group Size: When It Matters and When It Doesn't.
PUB DATE 77
NOTE 23p.; Paper presented at the Annual Meeting of the Midwestern Psychological Association (Chicago, Illinois, May 5-7, 1977) ; Contains occasional small type

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Aggression; *Audiences; *Behavior Patterns; *Expectation; Group Behavior; *Individual Psychology; *Social Behavior; Social Psychology; State of the Art Reviews
IDENTIFIERS *Group Size

ABSTRACT

The individual who is a focus of public attention is an active constructor of outcomes. He attempts to anticipate important characteristics of his observers and modifies his reactions in order to control likely consequences. The nature of the task is also of central importance. For socially relevant responses the individual's behavior is closely linked with these predicted consequences. In many situations, especially those that involve socially inhibiting or embarrassing qualities, the presence of one other person will cause the individual to adopt socially desirable responding, and the presence of more others has little or no additional effect. For drive-sensitive behaviors an individual's responses should reflect the drive-inducing characteristics of the situation. As the social facilitation literature shows, perhaps the most important factor is others' evaluative capabilities. In the audience situation this factor is of primary importance, and it is this factor to which the performer most likely attends. Audience size, by itself, provides only information about the possibility that an expert may be present. Thus, a performer's reactions are seen as primarily a function of the most expert or consequential observer. Existing theoretical models which attempt to describe these types of group size phenomena must be modified to incorporate such an inferential process. (Author)

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Group Size: When It Matters and When It Doesn't†

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Five years ago today, I attended my first psychology convention. It was the 44th meeting of the Midwestern Psychological Association, and that year it was held in Cleveland. My reason for going was to hear an address by Professor Zajonc on the then current status of social facilitation (Zajonc, 1972). At the time I was conducting my dissertation which was designed to examine the influence of an audience on aggressive behavior. I can still clearly recall the introductory remarks in that presentation. Professor Zajonc began by asserting that there are two kinds of social psychologists. There are those who look for the simple yet pervasive principles of social behavior. They seem to be able to look through a jungle of error variance and detect an underlying fundamental statement. And then, there are social psychologists who see the world as enormously complex and who seemingly strive to preserve this complexity in much of what they do and say. At the time, I was a little disturbed by this dichotomy because I felt that I was probably closer to the former type, yet possessed at least some of the latter tendencies as well. I have always appreciated the esthetic mathematical simplicity of the laws of gravity, planetary motion, and relativity. Yet, I have also been fascinated by the exceptions to every "law". I'm not sure if this is a carry over from my grade school days when I enjoyed annoying my science teachers, or a result of my personality research training, where we would search for the variable that interacted with whatever someone thought was the rule. In any event, today I would like to present a brief overview of some "laws" of group influence, and what may be a few important exceptions to these laws.

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† Presented as part of a symposium on Other Presence: Four Different Perspectives MPA, 1977.

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Group Size Theories and Generalizations

Notions regarding the influence of group size tend to fall into two broad categories. The first of these are concerned primarily with group measures of group processes or performance. The remainder are more directed toward the influence of group size on the individual.

One of the first of the former types is an empirical generalization from a creativity study reported by Gibb (1951). Gibb found that both feelings of threat and idea production were negatively accelerating functions of the size of the task group. A little more precision was added to this notion by Tannenbaum (1962) who observed that membership activity, interest level, and feelings of influence were also nonlinearly related to group size. Tannenbaum viewed this as an analog of the Weber-Fechner law and suggested that members' reactions were a logarithmic function of the size of the group. In 1963 Thomas and Fink reviewed the literature on group size, pointed out a number of important methodological issues, and concluded that "the variable of group size should be included in theories of group behavior". (p. 383) Finally, in 1972, Steiner provided such an organization and made important distinctions between disjunctive, conjunctive, additive, and divisible tasks. This included testable theoretical models for these various situations, as well as providing for the possible determination of threshold and critical group size effects. This approach has generated a considerable body of research which is far beyond the scope of this presentation.

We turn now to the second type of group size theory -- those that are concerned with the influence of group size on the individual. Here we find a broad range of dependent variables, including emotional reactions, learning and performance measures, as well as social responses of imitation, aggression, speech behavior, and even perambulation.

Historically, an important part of this approach finds roots in the research area commonly called social facilitation. Of particular importance, of course, is the extension of Hull-Spence learning theory (Spence, 1958) by Zajonc (1965). Although social facilitation theorists have generally been more concerned with the extent to which the influences associated with the presence of others is a learned drive, Weiss and Miller (1971) do suggest that instrumental avoidance responses should be an increasing function of an audience's size and/or its evaluative potency. While the literature seems to support this contention regarding the audience's evaluative role, the effects of audience size are less clear. It is of some interest in the former instance to note the results of a recent poll conducted by a marketing research group (Bruskin, 1973). They asked people to indicate their common fears. Speaking before a group was the most prevalent fear that people admitted experiencing, ranking above fear of heights, dogs, darkness, loneliness, insects, sickness and even death. Thus, Weiss and Miller's contention that audience observation is usually an adversive drive seems especially tenable.

Additional precision was applied to Weiss and Miller's drive summation conclusion by one of Professor Zajonc's students, Malcolm Brenner. Brenner (1974) saw a parallel between S.S. Stevens' (1957, 1966) work on perception and performer's reactions to an audience. In a cleverly executed study he unobtrusively measured the vocal stress of subject performers as they read Edgar Allen Poe's poem "The Bells" before audiences of 0, 2, 8, or 22 members. Comparison of the independent-

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Figure 1

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dependent variable relationship showed a striking resemblance to a power function.

Similar, though more elaborate utilization of Stevens' notions has been presented in Latané's (1973) Theory of Social Impact. According to Latané's formulation, the social impact experienced by an individual is described as either an increasing negatively accelerating or negatively decelerating power function of the number of others. Of particular importance in Latané's formulation is the distinction between whether others stand as a source of impact (as in the audience situation) or stand with the individual and share some source of impact (as in the

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Figures 2a & 2b

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diffusion of responsibility, or shared stress situations). In the former instance, negatively accelerating positive functions of the number of others are expected, whereas in the latter case decelerating negative functions should be evidenced. This model has several important features. First, it can offer some explanation why others' presence can sometimes be a source of arousal, while at other times have a calming effect. Second, it has the possibility of describing reactions to complex social situations wherein the individual may see some of the people in a situation as "with" him and others "against" him. Finally, the theory suggests that in addition to the number of others, the immediacy of others in a situation also importantly determines the individual's feelings and behavior.

The last model of group size effects that I will mention is the social physics formulation developed by my co-panelist Eric Knowles. Rather than steal his thunder, I shall carry on with my own presentation, so that you can hear his ideas from the one best qualified to present them (Knowles & Matter, 1977).

For the most part, the notions that I have so far outlined rely fairly heavily on some variation of what I call a "social energy" assumption. That is, they tend to view the organism as recipient of external influences which produce reactions. In the case of audience size, they portray the individual as a target of social attention and this attention combines in some mathematical fashion which results in generally increasing, but seldom linear, fashion. Before I discuss these mechanistic models further, however, I would like to review some evidence from the audience situation that is not directly related to the size of the audience.

The Audience

In social psychology, I especially like theories that help me predict my own behavior and social facilitation has long been one of my favorites. Most useful, was the conclusion that dominant responses are facilitated in the presence of an audience. This has been an excuse for me for countless hours of musical practice, and rehearsal of lectures and presentations. Nonetheless, it is easy to observe in myself, that who I am performing for is also of considerable importance in determining my execution of learned materials. It is also easy to observe that a wide range of social behaviors that don't have elaborate schedules associated with them are also importantly influenced by the presence and or characteristics of others.

It was with this interest that I arrived at graduate school in 1968. I began working with Stuart Taylor on aggression, and shortly after reading Zajonc's (1965) paper, I set out to demonstrate the social

facilitation of aggression. I placed subjects in a situation where they could shock another person, I attacked some of them and not others, and I had some of them watched by an audience and others were alone. At the same time I was doing this, Robert Baron was doing the same thing (Baron, 1971). As fate would have it (or so it seemed to me at the time), I found that an audience facilitated aggression, but Baron found that an audience inhibited aggression. After some despair and rumination, I arrived at the conclusion that aggressive behavior, and possibly many other socially relevant responses, are determined by who is watching as much as, if not more than, whether or not anyone is watching.

To test this cognitive-expectancy formulation of audience effects, I again looked at aggressive behavior. I gave college men an opportunity to shock another student while they were observed by either a male or female silent onlooker. The results were clear, my subjects set significantly higher shocks for their opponent in the presence of a male, but showed a slight inhibition of aggression in the presence of a

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Figure 3

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female. As soon as the observer left the situation, the differences disappeared. I found similar results when the observer (male or female) was believed to be a karate instructor or a pacifist. At this point, I concluded that aggression, at least, was more a function of the individual's expectations for approval or disapproval for such behavior, based on the inferred or explicit values of an observer, than it was a function of the individual's level of drive or arousal. This was when first I came to the Midwestern Psychological Association. I came because I had several hunches about the audience situation. These hunches were more or less that:

(1) audiences have both drive-like and value-directive properties; (2) responses range along a continuum of social relevance, and as the response approximates the high social relevance end of the dimension, it was more governed by other's expectancies. And finally, (3) I had a feeling that in most instances people who are the focus of public attention want to appear consistent. I had observed this kind of normative perseveration among my aggression subjects in the presence of an audience. Similar leveling phenomena had been noted in the

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Figure 4

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early studies of Allport (1924).

Thus, at the time I felt that any comprehensive theoretical account of audience influence must incorporate both drive-like and cognitive components. I was already familiar with Cottrell's (1968) "anticipations of positive or negative outcomes" explanation for audience's drive properties. But I was especially happy to hear Professor Zajonc conclude that a major difference between social and non-social sources of stimulation was that social sources were more unpredictable. This was the piece that my puzzle needed, the concept of predictability. If we borrow from Hendrick and Jones' (1972) goals of science (i.e., prediction, understanding, and control), it is possible to view the human being not so much as a passive reactor in audience situations, but as an active constructor of possible outcomes, as a scientist. Thus, in these situations it appears that the person attempts to predict and control both his own, and if possible others' reactions.

Support for this notion comes from a variety of audience studies, many of which were designed to examine issues other than social facilitation. Fouts (1970), for example, varied the number of exposures to a model orthogonally with whether imitation was measured in the presence or absence of an audience. Contrary to what might be expected, he found less imitation in the presence of an audience, even in the repeated exposure conditions, where imitative responses should have been dominant.

In a study of reference groups and social perceptions, Grace (1951) examined the effects of degree of foreknowledge about an audience on recall. He showed subjects a large array of objects ranging from intimate feminine to intimate masculine apparel. The subjects were instructed to try to remember as many of the articles as they could because they would have to recall what they had seen later in the experiment. Half of the subjects were told that the recall test would be administered by a female. No mention of the tester's sex was mentioned to the other subjects. All subjects were tested in the presence of a female. No difference was found between the groups in terms of the total number of items recalled. However, subjects who had foreknowledge that they would be tested in the presence of a female reported more female articles than subjects in the control group.

A number of studies of attitude change have also manipulated audience characteristics. Among these, the influence of the anticipated audience attitudes on long term recall is of particular interest. In these studies we find that pro arguments (statements that the subjects expected the audience to agree with) were recalled better than arguments that were contrary to the anticipated audience's attitude (Schramm & Danielson, 1958; Zimmerman & Bauer, 1956).

Taken together, these findings and the previously noted audience

influence on aggression suggest an alternate interpretation. They indicate that an individual's response, in the presence of an audience, is modified in accordance with the characteristics of the observers (e.g., their sex, status, values, etc.). Or as Bandura, (1971) in his social learning model has emphasized: "As a result of prior experience, people come to expect that certain actions will gain them outcomes they value . . . actions are therefore regulated to a large extent by anticipated consequences". (p. 3)

This approach also shares the essential feature of Cottrell's (1968) contention that an audience's drive-like influence results from "anticipation of positive or negative outcomes". In many social facilitation learning-performance studies, anticipations of evaluation have been shown to produce drive linked phenomena (Cottrell, Wack, Sekarak and Rittle, 1968; Henchy and Glass, 1968; Paulus and Murdoch, 1971). In other situations, such as the imitation, aggression, and selective recall studies that I have discussed, the individual's behavior seems to be more directly tied to the anticipated audience reactions. Consequently, it appears that the individual who is being watched quickly makes an assessment of the known or inferred characteristics of the observers. That is, he tries to predict their values, expectancies, and/or probable reactions. The individual then modifies his behavior in accordance with this inference process so as to maximize the likelihood of favorable evaluations, or what we might call "to look good" (Goffman, 1959; Brown, 1970).

To review then, we find that for drive sensitive tasks an audience's evaluativeness has strong arousing properties which energize responses. In situations that involve less drive sensitive but more culturally value-relevant behaviors, an audience's level of expertise is also important

but has directional as well as energizing properties. In these situations who the audience is (on the behavior relevant dimensions) is often more important than whether or not an audience is present. This distinction between drive motivated versus approval motivated responses and the notions of predictability and control can be seen as the essential feature of audience situations. It is with these thoughts that we now examine the issue of audience size.

Audience Size: When It Has Mattered

In this section several studies will be reviewed that have examined the influence of audience size on a variety of behaviors. In the joint interest of brevity and generality, I shall restrict this review to studies that have utilized physically-present "live" audiences rather than role-play, paper and pencil, or other imaginative manipulations of audiences.

Estimation of Audience Size. One question that must first be addressed is: To what extent can people accurately estimate the number of others in an audience? In the previously discussed study by Brenner (1974), subjects were asked to recall the number of audience members following their performance. While a slight tendency to overestimate larger size audiences was noted, subjects were, overall, quite capable of discriminating different numbers of observers. Similarly, in a recent study of my own (Borden, 1977) subjects sang aloud to audiences of 1, 2, 4, or 8 members after which they were asked to recall the number of observers. Like Brenner's findings there was a slight tendency to over-estimate larger audiences, but the overall linear correlation between actual and estimated audience size was still above .95. Extending this to

still larger estimates, Andy Schettino and I had students in classes that varied in size from 13 to 279 quickly estimate the number of others in the room. Again, estimates were extremely accurate with an r of .99 (Schettino and Borden, 1976). In sum then, individuals (whether as performers or as audience members) do accurately perceive the number of others in an audience.

Audience Size and Behavior. Next, if we look at studies that have found increasing audience size phenomena, we note that the largest difference is typically between the alone and the single observer conditions. Thus, whether subjects are walking around a seated group (Knowles, Kreuser, Haas, Hyde & Schuchart, 1976) or reading prose (Porter, 1939) the act of being

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Figures 5a, & 5b

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watched by a single person has larger consequences than those arising from the addition of substantially more members to the audience. These findings, in conjunction with the fairly consistent results in learning and performance studies showing large differences due to the presence of a single evaluator, indicate that the act of being watched by even a single other person has strong motivational properties. We will return to the question of why further increases in subject's reactions sometimes occur with additions of more observers. But first, let's examine several studies where no further changes in feelings or behavior were found with the addition of more than one observer.

Audience Size: When It Hasn't Mattered

In a replication and extension of my previously mentioned aggression study, Taylor (1977) attempted to determine whether the addition of a second male observer would further increase subjects' aggressiveness. While closely replicating the increased aggression found with a single observer, there was no indication of further increased aggression associated with the addition of a second male observer.

In another recent study, I measured willingness to sing among individual subject-performers in an audience situation (Borden, 1977).

Figure 6

Independent manipulations of audience size (1, 2, 4, 8) and audience immediacy (live versus video-taped) were examined and compared with performance in solitude. The presence of a single evaluator and the immediacy of the evaluator(s) significantly influenced duration of singing. However, increasing the size of the audience did not result in any further reluctance to perform. Finally, a few years ago, Young (1965) varied audience size from 1 to 4 and found no effect on either

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Figure 7

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speech disfluencies or ratings of difficulty among stutterers.

Determinants of Audience Arousal: Who versus How Many?

A closer examination of these studies reveals a common factor which may explain why in some instances reactions increase with increased audience size and in other instances they do not. In both the Knowles' et al. (1976) pedestrian-avoidance study and Brenner's (1974) vocal stress study, subjects were unaware of audience composition (i.e., the characteristics of the observers were unspecified). Similarly, in Porter's study (1939) which found increased stuttering associated with increased audience size, a varying arrangement of unspecified experts and strangers were used. Thus, it seems that the lack of specification of the characteristics of increasing sized audiences may be involved. Since we know that an observer's level of

expertise markedly increases evaluation apprehension, this factor may be considered as a primary determinant of a performer's reaction. If, for example, a performer is being observed by, say, three non-experts and one expert should arrive, this person will have a unique and powerful impact on the performer. In other words, the performer's reactions may be considered to be primarily a function of the most evaluatively potent observer in the audience -- as anyone who has had his or her teaching abilities directly evaluated is undoubtedly aware.

In other words, when the performer does not know the relevant characteristics of the audience members, evaluation apprehension would be expected to increase as a function of audience size. Such expected increases follow from the fact that, as the size of the audience increases, so does the likelihood of the presence of an expert from whom important anticipated consequences may result. To review then, in the unspecified audience situation the performer makes inferences about anticipated outcomes. As the size of the unspecified audience increases, so does the probability of an expert which results in increased evaluation apprehension for the performer.

If we look now at the studies that have failed to find increasing reactions to growing audiences, we note that in these cases subjects were aware of the relevant audience members' characteristics. For example, in Taylor's (1977) recent aggression study, subjects were aware of the observer's sex. Since the heightened aggression associated with a male observer is based on a generalized expectancy for assertiveness associated with being a male (Borden, 1975), the addition of another male observer should provide identical anticipated consequences. Therefore, no increase in aggressiveness would be expected, and none was observed. In my study that manipulated audience size and audience immediacy in an embarrassment-singing situation

(Borden, 1977), large increases in reluctance to sing were found between the alone and the single member audience conditions. Further, whether or not the subject could anticipate important consequences (i.e., "live" audience reactions) also strongly influenced singing. However, increasing the size of the audience from one to eight members had virtually no effect. In all the conditions of this study the audience members were described as "graduate students in the psychology of music". Considering that the experimental task was singing, this was an audience with a fairly high but consistent level of expertise. Finally, in the experiment reported by Young (1965) we note that the single member audience consisted of the experimenter who was a speech clinic director and, presumably, an expert on speech behavior. The audience size manipulation from two members to four members included adding one, two, or three female secretaries to the audience. Thus, in this situation we find that while the audience size may be increased, level of expertise remained constant.

Conclusions and Implications

In this paper I have portrayed the individual who is a focus of public attention as an active constructor of outcomes. As such I have suggested that the individual attempts to anticipate or predict important characteristics of his observers and modifies his reactions in order to control likely consequences from the observers. I have further indicated that the nature of the task is also of central importance. For socially relevant responses the individual's behavior is closely linked with these predicted consequences. Consequently there are many situations, especially those that involve socially inhibiting or embarrassing qualities, where the presence of one other person will cause the individual to adopt socially desirable responding and the presence of more others should have little or no additional effect. For example, it requires

only one other person to be present in order to reduce nose-picking behavior, mumbling to yourself, and so on. Similarly, it requires the presence of only one officer of the law to produce safe driving habits and one minister to curtail irreverent speech.

For drive sensitive behaviors an individual's responses should reflect the drive inducing characteristics of the situation. As we have seen in the social facilitation literature, perhaps the most important factor is other's evaluative capabilities. In the audience situation it is this factor that is of primary importance, and it is this factor to which the performer most likely attends. Audience size, by itself, provides only information about the possibility that an expert may be present. Thus, a performer's reactions are seen as primarily a function of the most expert or consequential observer. Accordingly, existing theoretical models which attempt to describe these types of group size phenomena must be modified to incorporate such an inferential process.

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Figure 1. (From Brenner, 1974)

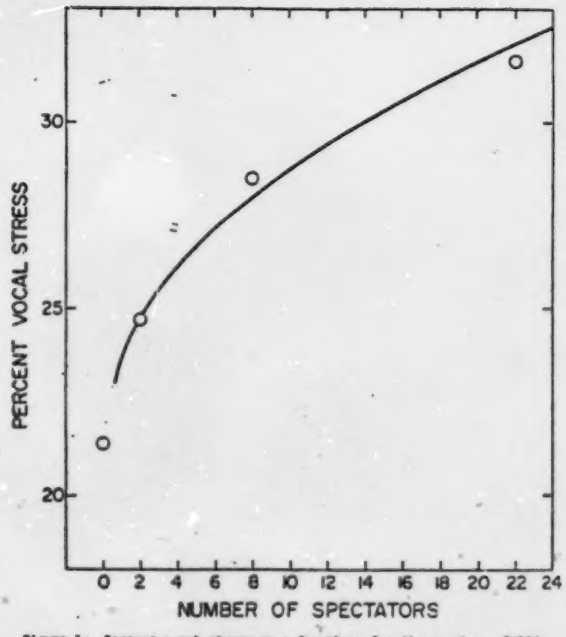
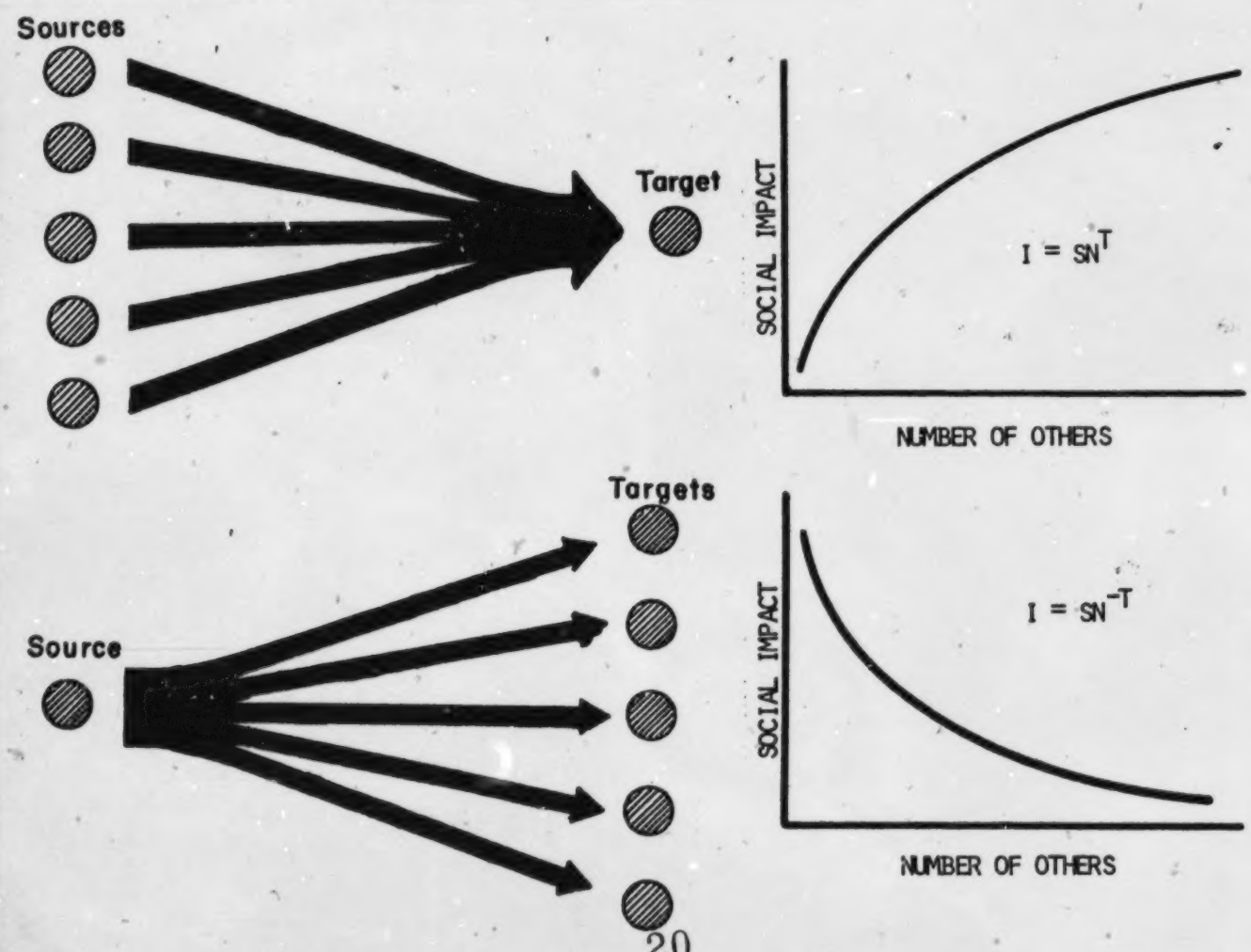


Figure 1: Percent vocal stress as a function of audience size. Solid line represents best fitting power function, $y = x^{.47}$.

Figures 2a & 2b (From Latané, 1973)



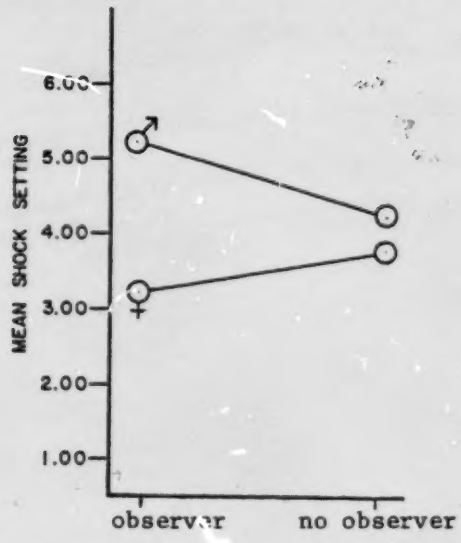


Figure 3. Aggressiveness as a function of the presence of a male or female observer and subsequent alone behavior. (From Borden, 1975).

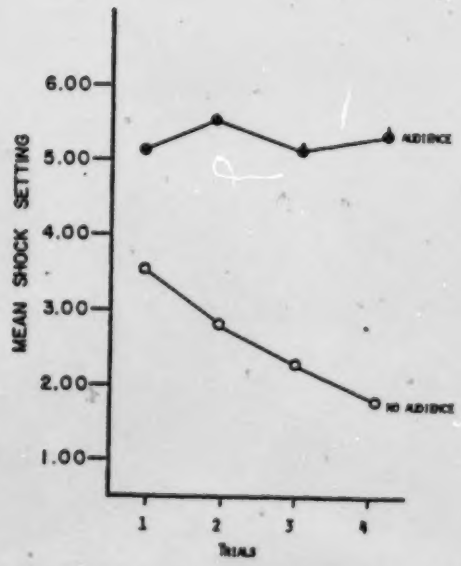


Figure 4. Perseveration of initial shock setting by subjects in the presence of an audience. (From Borden and Taylor, 1973).

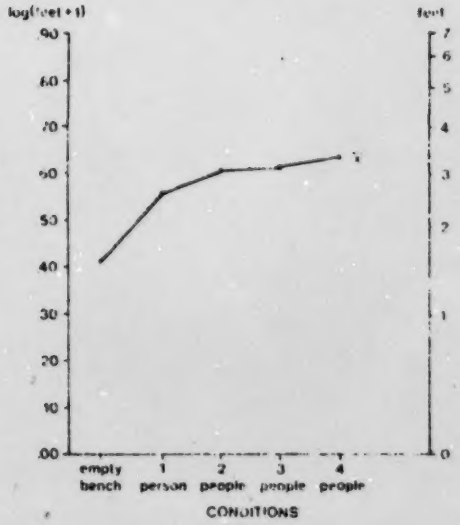
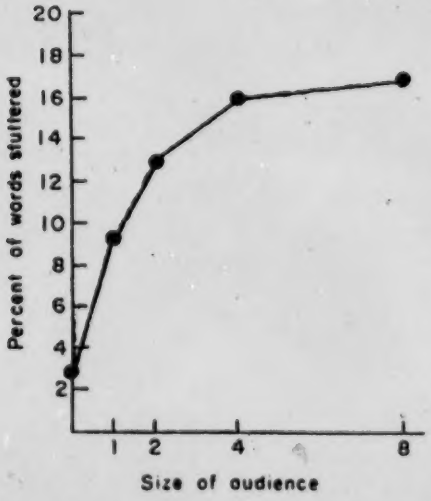


Figure 5a. Avoidance of an empty bench and occupied bench (1-4 persons) by pedestrians. (From Knowles et al, 1976).

Figure 5b. (From Porter, 1939)



Stuttering as a function of audience size

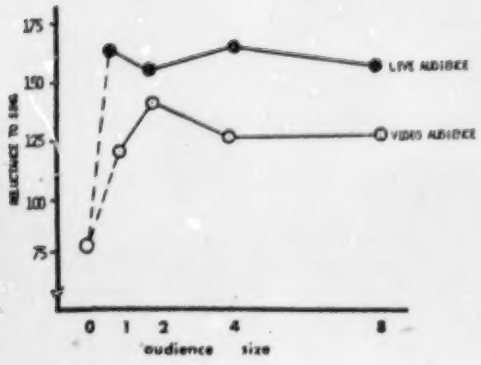
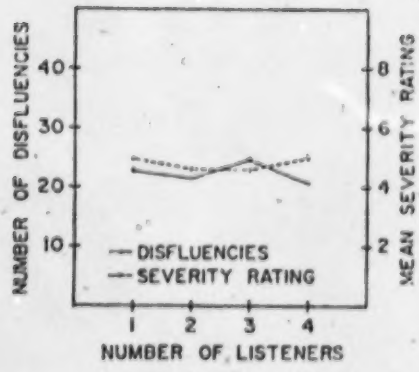


Figure 6. Reluctance to sing (200 - number of words sung) as a function of audience size and audience immediacy (From Borden, 1977)



Number of disfluencies for which there was at least 75% agreement (solid line) and mean severity rating (broken line) for four audience size conditions.

Figure 7. (From Young, 1965).